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# **Value investing in emerging markets:**

## **Local macroeconomic risk and extrapolation**

Roy Kouwenberg and Roelof Salomons \*

SOM theme E: Financial markets and institutions

### **Abstract**

Our results confirm the profitability of value investing at the country level in emerging markets. A portfolio of countries with low price-to-book ratios significantly outperforms a portfolio of high price-to-book countries. Global risk factors cannot explain this outperformance. Next we measure a number of macroeconomic variables of the countries in the long and short value portfolios, as a proxy for local risk factors. We find that the countries in the low price-to-book portfolio on average have significantly lower economic growth, higher growth volatility, higher inflation, more overvalued currencies and more volatile currencies, compared to the high price-to-book portfolio. After portfolio formation, the difference in economic fundamentals between the high and low price-to-book portfolios decreases significantly, which indicates that investors might be extrapolating past economic trends too far into the future.

Keywords: Value, macroeconomics, emerging markets

JEL Classifications: F30, G11, G12, G15

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## 1. INTRODUCTION

Emerging markets have been a fertile ground for economic and financial market research in recent years. One argument behind the interest is that emerging markets provide great out-of-sample tests of existing models. Studies using US data show that there is a value premium: value stocks outperform growth stocks (Fama and French [1992, 1996] and Lakonishok, Shleifer and Vishny [1994]). Portfolios of stocks with low price-to-book (P/B) values, price-to-earnings or price-to-cash flow multiples deliver excess returns, which cannot be accounted for with standard asset pricing models. Fama and French [1998] provide similar evidence for several other developed equity markets. As value strategies in developing markets have not been studied extensively yet, this paper further examines the robustness of the value premium in emerging markets.

Empirical literature suggests that the same factors that drive cross-sectional return differences in developed markets are also present in emerging markets. Claessens, Dasgupta and Glen [1998], Rouwenhorst [1999] and Barry, Goldreyer, Lockwood and Rodriguez [2002] provide evidence that individual stock selection on the basis of value generates outperformance in emerging markets. Van der Hart, Slagter and Van Dijk [2003] extend this work to a broader range of trading strategies. Besides value, they show strong excess returns for strategies based on price momentum, as in Jegadeesh and Titman [1993], and earnings revisions. In this paper we will focus purely on the value anomaly. Our approach differs from other valuation studies as we focus on country selection strategies, as Serra [2000] reports that country effects are the most important factor explaining emerging market returns. We find additional evidence supporting the existence of a value premium in emerging markets: a portfolio invested in countries with low price-to-book values significantly outperforms a portfolio of high price-to-book countries.

The interpretation of the value premium is still strongly debated. Two conflicting explanations are often considered: on the one hand, the premium might be a

compensation for risk, while on the other hand, it could arise due to under- or overreaction to new information. As in Rouwenhorst [1999], we are unable to explain the value premium with global risk factors, which leaves local risk factors as a potential explanation for the excess returns. We focus on macroeconomic variables as proxies for local risk. In the developed markets, the link between asset returns and macroeconomic risk factors is well established, mostly in an APT context (see Chen, Roll and Ross [1986] and Burmeister and McElroy [1988]). For emerging markets there are only a few studies linking macroeconomic variables and emerging market returns (e.g. Harvey [1995] and Bilson, Brailsford and Hooper [2001]). We extend this research and show that the countries with low and high price-to-book values differ significantly in terms of their local macroeconomic conditions, described by variables such as economic growth, inflation and currency stability.

We find that the countries in the low price-to-book quartile portfolio on average have significantly lower real GDP growth compared to the countries in the high price-to-book quartile portfolio. Similarly, the countries in the low price-to-book portfolio have higher volatility of GDP growth, higher inflation rates and more currency risk at the time of portfolio formation. Apparently, the low price-to-book countries seem to be “losers” based on macroeconomic fundamentals. Investors might therefore demand a higher risk premium for the equity markets of the low price-to-book “loser” countries. However, this risk premium seems overdone, given the substantial outperformance of the value strategy. An alternative explanation for the relationship between the value premium and local macroeconomic conditions might be that investors extrapolate current economic conditions of emerging markets too far into the future (analogous to the findings of Lakonishok, Shleifer and Vishny [1994] for US value stocks). We track the economic performance of the countries in the low price-to-book portfolio up to 36 months after portfolio formation. We find that the gap in economic fundamentals between the “loser” portfolio of low price-to-book countries and the winner portfolio closes significantly

within 36 months. Investor expectations about economic conditions and growth of the “loser” countries might be too low to start with, leading to sequential outperformance of the equity markets as economic fundamentals beat expectations.

The following section describes the emerging markets data used in the paper and provides some descriptive statistics. In Section 3 we demonstrate the existence of a value premium in emerging markets and we try to explain it with global risk factors. In Section 4 we establish a link between local macroeconomic variables and the returns of the value strategy. We also test the extrapolation hypothesis. The final section concludes and summarises our findings.

## **2. DESCRIPTION OF THE DATA**

### **2.1 Countries and variables**

In our study we focus on 23 emerging markets from the regions Asia, Latin America and Europe, Middle East and Africa (EMEA). The respective countries are listed in Table 1. We confine our study to the countries in Table 1, as these tend to be the emerging markets professional investors focus on. We do not include smaller and less liquid markets, as this could lead to investment strategies that are very hard to implement due to transaction costs and other restrictions.

The sample period starts in January 1991 and ends in December 2001. These eleven years are interesting for emerging markets research, as they resemble a “tale of two cities”. The first part contains the period 1984 – 1994 in which emerging markets showed strong returns following the Latin American debt crisis. In the second part, 1995 – 2001, emerging markets suffered severely. This period had miserable returns and severe crises, which began in 1995 in Mexico, continued in Asia in 1997 – 1998, and culminated in the Russian default on debt payments in 1998. One year later, in the beginning on

1999, Brazil was forced to devalue its currency and only recently, in 2002, Argentina defaulted on its debt payments.

**Table 1: Emerging markets**

Asia	Latin America	EMEA
China	Argentina	Czech Republic
India	Brazil	Egypt
Indonesia	Chile	Hungary
Korea	Colombia	Israel
Malaysia	México	Poland
Philippines	Peru	Russia
Taiwan	Venezuela	South Africa
Thailand		Turkey

The choice of the sample period is of importance in light of the changes that occurred in emerging markets. In the literature structural changes, economic reform and integration (e.g. Bekaert [1995], Stulz [1999], Henry [2000] and Bekaert and Harvey [2000]) are often quoted as a starting points for pronounced changes in emerging economies and their financial markets. Opening of emerging capital markets led to international risk sharing, impacted expected returns, had ambiguous effects on market volatility and resulted in higher correlation with the world (see Bekaert and Harvey [2002] and references herein). As documented by Bekaert [1995], several of these changes started in the late 1980s and early 1990s. The transition phase can be considered as a structural break in the data.

At the moment there is still considerable debate whether the emerging financial markets are integrated or segmented. Bekaert and Harvey [2002] document that all we know at present is that emerging stock markets are partially integrated and the level of integration is time varying. Van der Hart, Slagter and Van Dijk [2003] test for the impact of the structural changes and find no evidence of an effect on the value premium. We set the beginning of our sample period in January 1991, arguably the period when most

liberalisations already occurred, in order to diminish the impact of liberalisation and market integration on the results.

Macroeconomic variables are all from the International Financial Statistics (IFS) database of the International Monetary Fund. We have collected data on real economic growth, inflation and interest rates on a monthly basis. Spot exchange rates and exchange rates based on Purchasing Power Parity (PPP) are collected for all markets. During the sample period several countries moved from a fixed exchange rate system to a flexible system, which warrants attention to both versions. We use the Standard & Poor's and International Financial Corporation (S&P / IFC) indices for emerging equity markets. All returns are monthly total returns denominated in US dollar, starting from 1976 for some countries. Price-to-book and earnings data for these indices is also from S&P / IFC.

## **2.2 Descriptive statistics**

One of the attractions of emerging markets is clear when examining Table 2, which shows average real GDP growth and inflation for a selection of countries. Several countries have shown fast, but volatile growth. A priori, investors in emerging markets should expect higher relative rates of return on capital because of the relatively high potential growth rates and the greater risks associated with investments in developing economies. There have been periods of high inflation as well: most notable examples are Argentina and Brazil, which experienced hyperinflation in the early 90's.

Table 3 shows the average monthly return and standard deviation of the emerging equity markets, represented by the S&P / IFC indices in US dollar. We measure returns in US dollar, as we study emerging markets from the point of view of a foreign investor. The impact of currency fluctuations can be large: for example, in the period 1990-1995 equities in Brazil showed a local currency gain of 12,854,287% while they gained "only" 204% in US dollar terms due to severe local currency depreciation.

**Table 2: Real GDP growth and inflation in emerging markets.** The table shows the averages and standard deviations of real economic growth and inflation in year-over-year terms for the sample period 1991-2001. To contrast differences between emerging and developed markets, we show equivalent data for the US.

	Real growth	Standard deviation	Inflation	Standard deviation
Argentina	3.5%	4.4%	17.0%	55.1%
Brazil	2.2%	1.8%	585.6%	1061.8%
China	9.8%	2.2%	7.8%	10.8%
Chile	5.6%	2.8%	9.8%	6.1%
Colombia	2.7%	2.5%	18.8%	6.2%
Czech Republic	4.1%	9.9%	43.0%	80.5%
Egypt	4.0%	1.1%	8.3%	4.8%
Hungary	0.9%	4.5%	19.2%	7.1%
Indonesia	4.2%	5.2%	15.6%	13.5%
India	5.4%	1.5%	9.3%	8.4%
Israel	4.6%	2.2%	9.2%	5.5%
Korea	6.1%	3.4%	5.8%	3.4%
Malaysia	6.6%	4.0%	3.3%	1.9%
Mexico	3.3%	3.9%	16.9%	9.1%
Peru	3.7%	3.7%	181.9%	586.6%
Philippines	3.0%	1.9%	8.0%	5.3%
Poland	3.2%	4.6%	44.2%	79.9%
Russia	-4.2%	6.8%	130.7%	169.4%
South Africa	1.4%	1.8%	8.8%	2.5%
Taiwan	5.6%	1.7%	2.4%	1.8%
Thailand	4.6%	5.2%	4.6%	2.1%
Turkey	2.7%	4.0%	67.4%	22.3%
Venezuela	1.5%	3.9%	48.4%	44.4%
US	3.1%	1.6%	2.2%	0.7%

Source: IFS.

The standard deviation of monthly emerging market equity returns in Table 3 is considerably higher than in developed markets. Moreover, emerging equity market data is non-normally distributed, as documented by Harvey [1995] amongst others. Observing the summary statistics in Table 3 confirms this aspect for our data. The existence of higher moments means we need to consider measures of risk beyond standard deviation and beta (e.g., Estrada [2000] advocates using downside risk as the risk measure for



emerging markets). Further analysis of the data also reveals that the majority of the country returns are autocorrelated.

**Table 3: Summary sample statistics.** This table shows the starting date of the sample for each country, the average monthly returns in US dollar, the standard deviation of the returns, the downside deviation of the returns (2<sup>nd</sup> moment), the median return and the average price-to-book ratio (P/B).

	Start of sample	Mean return	Standard deviation	Downside deviation	Median return	Mean P/B
Argentina	Jan-91	1.82%	14.6%	7.2%	1.34%	1.37
Brazil	Jan-91	2.40%	14.3%	8.0%	1.76%	0.81
China	Feb-93	1.09%	13.9%	5.3%	-0.01%	3.28
Chile	Jan-91	0.99%	7.7%	4.7%	0.29%	1.76
Colombia	Jan-91	0.95%	10.1%	5.5%	-0.30%	1.14
Czech Republic	Jan-94	-0.59%	9.5%	5.6%	-0.40%	0.93
Egypt	Feb-97	-2.12%	7.1%	3.8%	-2.84%	2.70
Hungary	Jan-94	0.88%	11.8%	6.2%	0.83%	2.31
India	Jan-91	0.44%	9.5%	6.0%	-0.37%	3.25
Indonesia	Jan-91	-0.33%	14.7%	10.0%	-1.03%	2.22
Israel	Feb-97	0.81%	7.6%	3.6%	1.65%	1.61
Korea	Jan-91	0.49%	13.6%	7.9%	-1.76%	1.11
Malaysia	Jul-95	-0.49%	13.1%	6.5%	-0.53%	2.63
Mexico	Jan-91	1.25%	10.1%	7.1%	2.02%	1.84
Peru	Oct-93	0.60%	8.5%	4.6%	-0.16%	2.35
Philippines	Jan-91	0.39%	10.6%	6.5%	-1.01%	2.48
Poland	Jan-94	0.29%	13.2%	7.6%	0.56%	2.18
Russia	Feb-97	2.42%	21.6%	9.6%	3.97%	0.62
South Africa	Feb-94	0.08%	8.3%	5.2%	0.26%	2.08
Taiwan	Jan-91	0.56%	11.0%	6.2%	-0.15%	3.02
Thailand	Jan-91	-0.03%	13.5%	8.9%	-0.61%	2.25
Turkey	Jan-91	1.33%	18.8%	11.1%	-1.82%	4.11
Venezuela	Jan-91	0.28%	13.1%	8.9%	-0.71%	1.51
MSCI US	Jan-91	1.23%	4.1%	2.5%	1.48%	4.16

Source: S&P / IFC.

The high volatility and downside deviation of the returns clearly support the view that emerging equity markets are more risky than developed markets. In the sample period under consideration these risks were not always compensated by higher returns, as some emerging markets had negative or near-zero returns. We refer to Claessens,

Dasgupta and Glen [1995], Barry, Peavy and Rodriguez [1997], De Roon, Nijman and Werker [2001] and Salomons and Grootveld [2003] for research on the added value of emerging markets in a diversified equity portfolio. In the next section we study the existence of the value premium in emerging market returns.

### **3. THE VALUE BIAS IN EMERGING MARKET COUNTRIES**

In this section we test the presence of the value anomaly at the country level using emerging markets data. We first describe the methodology and show next that the value effect exists. Next, we attempt to explain the premium with global risk factors.

#### **3.1 Test methodology**

To test the presence of a value bias in emerging markets, we follow the standard approach of ranking countries according to their price-to-book ratio at the beginning of each month. We construct four equally weighted portfolios, consisting of the emerging countries in each of the four price-to-book quartiles, and we record the returns of each portfolio during the month. At the end of the month the quartile portfolios are rebalanced based on the new price-to-book ratios and the procedure starts again.

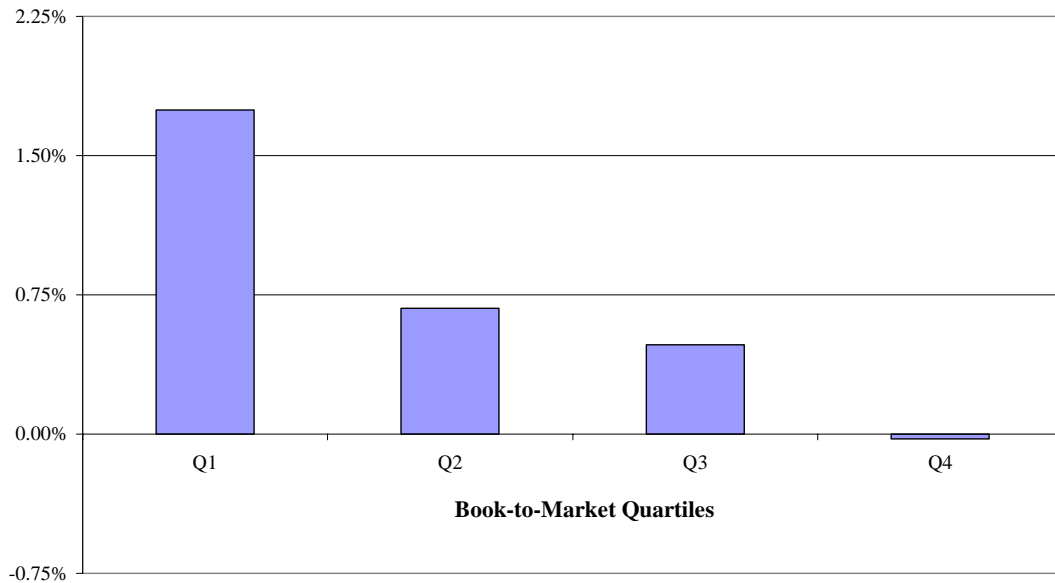
Apart from the return of the quartile portfolios, we also calculate the return on a “zero-investment” strategy, involving a long position in the first quartile countries (low price-to-book) and a short position in the fourth quartile countries (high price-to-book). In practice, short selling constraints may prevent implementation of such a strategy. As De Roon, Nijman and Werker [2001] show, this is particularly relevant for emerging markets. However, even if it is impossible to establish an outright short position, the excess returns on the long-short portfolio can still be interpreted as a strategy in which the long portfolio represents an overweight position relative to a given benchmark and the short position an underweight. Hence, the long-short portfolio also represents the returns on an active investment strategy, which can be implemented relative to a global emerging

markets equity benchmark.

### 3.2 Results

Figure 1 shows that investing in countries with low P/B ratios led to substantial outperformance in the sample period January 1991 until December 2001. In addition, the average return shows a persistent decline from the first to the fourth quartile. Figure 2 displays the cumulative performance of the zero-investment strategy that takes a long position in the countries of the first quartile (low P/B) and a short position in the countries of the fourth quartile (high P/B). Figure 2 indicates that the cumulative performance of the long-short value strategy has been quite stable through time.

**Figure 1: Performance of price-to-book quartiles.** The figure displays the average monthly return of the price-to-book quartiles in the period from January 1991 until December 2001. Q1 is the quartile portfolio with low P/B countries and Q4 is the high P/B quartile.



**Figure 2: Cumulative performance of the zero-investment P/B strategy.** The figure displays the cumulative return of the zero-investment P/B strategy (fat line), as well as the return on the long portfolio (Q1, top thin line) and short portfolio (Q4, bottom thin line).

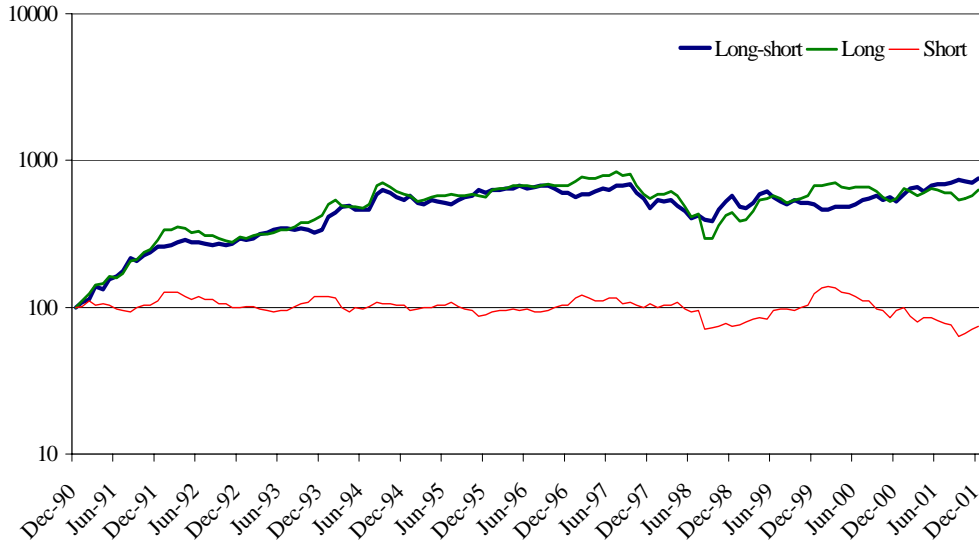


Table 4 shows the descriptive statistics of the monthly returns of the quartile P/B portfolios and the zero-investment strategy. As a benchmark, we also include an equally weighted index of all emerging markets. The statistics presented in Table 4 show that the average monthly return of 1.77% of the long-short value strategy is significantly positive. A valid concern might be the impact of transaction costs. However, even at a transaction cost rate of 1% per trade, the strategy still generates a significantly positive average monthly return of 1.34% (t-value 2.14). On average there are only two changes in the long-short portfolio each month: as a result turnover and transaction costs are limited. Hence, the zero-investment price-to-book strategy led to significant outperformance in

the period 1991-2001 and could have been an attractive strategy for emerging market equity funds. We will now investigate the risk of the value strategy.

**Table 4: Return and risk of the P/B strategy.** The table displays summary statistics of the quartile price-to-book portfolios, the zero-investment price-to-book portfolio and the equally weighted emerging markets index (EW Index).

	<b>EW Index</b>	<b>Long</b>	<b>Q2</b>	<b>Q3</b>	<b>Short</b>	<b>Long/Short</b>
<b>Average Return</b> (t-value)	0.73% (1.35)	1.75% (2.40)	0.68% (0.96)	0.48% (0.77)	-0.03% (-0.05)	1.77% (2.84)
<b>Standard deviation</b>	6.2%	8.4%	8.1%	7.1%	6.2%	7.2%
<b>Downside deviation</b>	4.3%	5.2%	4.7%	4.9%	4.7%	4.1%
<b>Downside correlation</b>	61%	51%	39%	61%	59%	2%
<b>Worst return</b>	-27.4%	-31.8%	-27.1%	-25.3%	-24.9%	-15.6%
<b>Worst month</b>	Aug 98	Aug 98	Aug 98	Aug 98	Aug 98	Jan 99

### 3.2 Risk of the value strategy

As discussed in the introduction, there is a strong debate surrounding the two potential explanations for the existence of the value premium. The first potential explanation is that the value premium is a compensation for taking on additional risk. For example, if the excess return of the value strategy is highly sensitive to the movement of the global equity market, then the value premium might simply be a reward for taking more beta risk. To test this, we run a linear regression of the P/B quartile portfolio returns in excess of the risk free rate on the excess return of the MSCI AC World Index in US dollar:

$$R_t - R_t^f = \alpha + \beta (R_t^m - R_t^f) + \varepsilon_t, \quad (1)$$

where  $R_t$  is the return of the quartile portfolio in month  $t$ ,  $R_t^m$  is the return on the world market portfolio,  $R_t^f$  is the risk free rate,  $\alpha$  is the alpha of the quartile portfolio,  $\beta$  is the beta of the quartile portfolio and  $\varepsilon_t$  is a normally distributed IID error term.

Table 5 shows that the beta of the first price-to-book quartile portfolio (1.09) is indeed larger than the beta of the equally weighted index (1.04) and considerably larger than the beta of the fourth quartile portfolio (0.86). However, note that the alpha of the first quartile portfolio is 1.07% and significant at the 10% level. Moreover, the beta of the zero-investment value strategy is only 0.23 and not significant, while the alpha is 1.73% and highly significant (t-value of 2.79). The  $R^2$  of the beta-regression for the long-short P/B strategy is only 2%. We therefore conclude that the world market beta cannot completely explain the positive performance of the zero-investment value strategy.

Given the lack of explanatory power of beta in empirical tests of the CAPM (see Fama and French [1992]), we will consider a number of alternative measures to assess the risk of the price-to-book strategy. Table 4 displays the standard deviation of the monthly returns, the downside deviation (2<sup>nd</sup> moment), the downside correlation with the MSCI AC World Index and the worst monthly return of the quartile portfolios. Interestingly, the first quartile portfolio of low price-to-book countries has the highest risk based on standard deviation, downside deviation and worst month return, while the fourth quartile portfolio has the lowest risk based on these measures. Apparently risk, regardless how we measure it, might be a plausible explanation for the value strategy's excess returns.

If we focus on the zero-investment price-to-book portfolio, Table 4 tells a different story about the risk of the value strategy. The zero-investment portfolio has a lower downside deviation than the equally weighted index (4.1% vs. 4.3%) and a considerably smaller worst monthly return (-15.6 % vs. -27.4%). The long-short portfolio has a downside correlation of only 2% with the MSCI AC World Index, while this correlation is 61% for the equally weighted benchmark. Hence, for an investor with a

long position in the world equity market, the zero-investment emerging markets portfolio has great diversification benefits and an attractive return.

As a next attempt to explain the performance of the long-short value strategy, we regress the portfolio returns on the Fama and French [1996] value and size factors, denoted by HML and SMB.

$$R_t - R_t^f = \alpha + \beta_m (R_t^m - R_t^f) + \beta_{HML} HML_t + \beta_{SMB} SMB_t + \varepsilon_t, \quad (2)$$

where  $HML_t$  is the return on the Fama and French value factor and  $SMB_t$  is the return on Fama and French size factor.

Table 6 reports the results of the regression, using the value and size factors for the US market (Fama and French [1996]). It is clear that the low P/B portfolio Q1 has a higher beta than the high P/B portfolio Q4 on both the value factor HML and the size factor SMB. However, this difference in exposure is hardly significant, as indicated by the results for the long-short portfolio. The long-short portfolio has an alpha of 1.6% (t-value 2.58), while the factor model can only explain 4% of its return variance. Even after imposing transaction costs of 1% per trade, the alpha of the long-short portfolio is still significant at the 10% level, so transactions costs are not affecting these conclusions.

Table 7 reports the result of a factor regression of the portfolio excess returns on the MSCI AC World Index excess returns and the HML value factor for international developed markets (described in Fama and French [1998]).<sup>1</sup> The conclusions are similar: the first quartile portfolio of low P/B countries has a higher exposure to the international value factor than the fourth, however this difference in exposure cannot explain the returns properly: the alpha of the long-short portfolio is 1.53% and significant. Our results at the country level are in line with the literature. Rouwenhorst [1999] and Van der Hart, Slagter and Van Dijk [2003] find that exposure to global risk factors cannot explain average returns on individual emerging market securities.

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<sup>1</sup> Unfortunately, data on the global SMB factor was not available.

As we are unable to explain the value premium by global risk factors, this suggests that local risk factors might explain the excess returns in emerging markets. The next section will study whether local macroeconomic risk factors account for part of the value premium in emerging markets.

**Table 5: P/B strategy returns and world market risk.** The table shows the results of the regression of the price-to-book portfolio excess returns on the excess returns of the MSCI AC World index in US dollar. T-values are between brackets. Estimates are also listed for the zero-investment price-to-book portfolio (Long/Short) and the equally weighted emerging markets index (EW Index).

	EW Index	Q1	Q2	Q3	Q4	Long/Short
<b>Alpha</b>	0.07%	1.07%	0.07%	-0.22%	-0.66%	1.73%
<b>(t-value)</b>	(0.18)	(1.71)	(0.12)	(-0.42)	(1.450)	(2.79)
<b>Market beta</b>	1.04	1.09	1.07	1.12	0.86	0.23
<b>(t-value)</b>	(10.1)	(6.91)	(7.30)	(8.52)	(7.52)	(1.49)
<b>R<sup>2</sup></b>	44%	27%	29%	36%	30%	2%

**Table 6: P/B strategy returns and the Fama & French factor model (US value and size factors).** The table shows the results of the regression of the price-to-book portfolio excess returns on the excess returns of the MSCI AC World index in US\$, the Fama and French HML value factor (US) and the Fama and French SMB small cap factor (US). T-values are between brackets. Estimates are also listed for the zero-investment price-to-book portfolio (Long/Short) and the equally weighted market index (EW Index). We refer to Fama and French [1996] for more information on the HLM and SMB factor portfolios.

	EW Index	Q1	Q2	Q3	Q4	Long/Short
<b>Alpha</b>	-0.11%	0.86%	-0.14%	-0.41%	-0.75%	1.60%
<b>(t-value)</b>	(-0.28)	(1.43)	(-0.24)	(-0.84)	(-1.69)	(2.58)
<b>Market beta</b>	1.07	1.15	1.09	1.17	0.84	0.31
<b>(t-value)</b>	(10.5)	(7.17)	(7.12)	(8.86)	(7.11)	(1.84)
<b>HML beta</b>	0.22	0.32	0.23	0.26	0.06	0.26
<b>(t-value)</b>	(2.20)	(1.98)	(1.50)	(1.96)	(0.47)	(1.58)
<b>SMB beta</b>	0.58	0.73	0.59	0.54	0.42	0.31
<b>(t-value)</b>	(5.08)	(4.03)	(3.39)	(3.61)	(3.15)	(1.64)
<b>R<sup>2</sup></b>	53%	35%	35%	42%	46%	4%





**Table 7: P/B strategy returns and the Fama & French factor model (international value factor).** The table shows the results of the regression of the price-to-book quartile portfolio excess returns on the excess returns of the MSCI AC World index in US\$ and the Fama and French HML value factor for international developed markets. Estimates are also listed for the zero-investment price-to-book portfolio (Long/Short) and the equally weighted market index (EW Index). We refer to Fama and French [1998] for more information on the HLM factor portfolio.

	<b>EW Index</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Long/Short</b>
<b>Alpha</b>	-0.01%	0.92%	-0.12%	-0.27%	-0.61%	1.53%
<b>(t-value)</b>	(-0.02)	(1.45)	(-0.21)	(-0.51)	(-1.31)	(2.43)
<b>Market beta</b>	1.04	1.09	1.05	1.13	0.86	0.23
<b>(t-value)</b>	(10.1)	(6.93)	(7.16)	(8.70)	(7.50)	(1.48)
<b>HML beta</b>	0.16	0.28	0.22	0.19	-0.08	0.36
<b>(t-value)</b>	(1.11)	(1.30)	(1.11)	(1.08)	(-0.48)	(1.67)
<b>R<sup>2</sup></b>	44%	28%	29%	37%	31%	4%

## 4. MACROECONOMIC FORCES AND VALUE INVESTING

In the literature there have been several attempts to link global macroeconomic variables and equity returns in emerging markets. Harvey [1995] finds limited exposure of emerging market returns to world growth, world inflation, oil and trade weighted exchange rates. Bilson, Brailsford and Hooper [2001] study both global and local macroeconomic variables and find evidence that local factors might proxy for sources of risk in emerging market returns. In this section we will select a number of local macroeconomic risk factors suggested in the literature and we investigate the exposure of the value strategy to these variables.

### 4.1 Local macroeconomic risk factors

The literature offers several suggestions for the link between macroeconomic variables and equity returns, e.g. Chen, Roll and Ross [1986] amongst others. It is widely accepted that stock levels are positively related to levels of real activity (see Ferson and Harvey [1994] for international evidence). We expect that emerging market investors appreciate

stable growth levels as well, as many developing countries have experienced serious setbacks during their development. Siegel [1999] documents that a more stable economic growth environment is one of the prime argument driving the strong US equity performance. A priori, we expect higher growth levels and more stable growth to be associated with lower investment risk.

Inflation is a second variable that has been studied extensively as a factor driving stock returns (Fama and Schwert [1977]). In theory equity should be viewed as an inflation hedge, due to fact that equity represents a claim on real assets, leading to a positive relationship between inflation and equity returns. However, Fama and Schwert [1977] find a negative relation between inflation and nominal stock returns. Ritter and Warr [2002] present evidence that valuation ratios tend to rise as inflation drops, which might be explained the “money illusion” of investors. In line with empirical evidence, we expect that a low and stable inflation rate reduces investment risk.

It is well documented that currencies occasionally deviate from purchasing power parity (PPP) (see e.g. Frenkel [1981]). Jorion [1991] shows that deviations from PPP will be priced to the extent that these deviations represent exchange rate risk that must be born by investors. Moreover, currencies tend to be highly volatile in emerging markets, which presents additional risk. Glen [2002] shows that stock market returns preceding an imminent devaluation are substantially below normal: investors demand a discount to take on the risk. In light of the evidence presented, we state that overvalued and volatile currencies lead to higher investment risk.

In the remainder of the paper we focus our attention on real economic growth, inflation and currency valuation, as local risk factors that might explain the value premium in emerging markets. Table 8 lists the local risk factors that we deem of importance and the macroeconomic variables used as proxies. We recognise that our selection of variables is not complete. Suggestions for other risk factors offered include the openness of the economy and the level of corporate governance. We have chosen not

to include the former factor in our empirical study, as the debate over the merit of an open economy for emerging markets is still open.<sup>2</sup> Klapper and Love [2002] show that inadequate corporate governance mechanisms will increase the cost of equity capital. However, as Bekaert and Harvey [2002] state, this research is still in its infancy and long-term data is not available.

**Table 8: Selection of local risk factors**

This table lists local risk factors deemed to have an effect on emerging market equity prices, followed by references and the macroeconomic variables used as a proxy for the risk factors.

	Local risk factors	References	Proxy the risk factor
1.	Currency valuation	Sachs, Tornell and Velasco [1996], Glen [2002]	PPPFX: percentage deviation of spot rate from PPP
	Currency stability	Frenkel [1981] Jorion [1991]	FXV: coefficient of variation based on 3 years of monthly data
2.	Economic growth	Ferson and Harvey [1994]	RG: real GDP growth (YoY change)
	Growth stability	Siegel [1999]	RGV: volatility of real GDP growth, based on 3 years of monthly data
3.	Inflation	Fama and Schwert [1977] Ritter and Warr [2002]	IF: inflation (YoY change)

## 4.2 Exposure of price-to-book portfolios to macroeconomic risk factors

Having observed the performance of the value strategies, which does not seem to be priced by global risk factors, we examine the relation between local macroeconomic

<sup>2</sup> In theory, an open economy (proxied by the level and/or changes in foreign direct investment) should lower the equity risk premium. However, liberalisations are not a positive per se. McKinnon and Pill [1996] state the adverse consequences of distortions that were magnified by capital account opening and financial deregulation. The contribution by Mishkin in Feldstein [2002] shows that several liberalisations were leading up to the crisis that emerging markets experienced in recent history. The IMF [2002] warns that the combination of deep financial integration with low trade integration is risky. Edwards [1987] points to the sequencing of integration. Stiglitz in particular [2000, 2002] is a source of discontent.

factors and the quartile P/B portfolio returns. In Section 3 we constructed the quartile portfolios each month on the basis of price-to-book ratios of the emerging stock markets. We now measure the macroeconomic variables in Table 5 for the countries in each P/B quartile at time of portfolio formation. As the portfolios are equally weighted, we also weight the macroeconomic variables of all countries in the portfolio equally each month, in order to get a time series of economic measures at the portfolio level.

Table 9 shows the average of these portfolio measures for the five macroeconomic factors under consideration: real economic growth, volatility of real economic growth, inflation, currency valuation and currency stability. From Table 9 we learn that on average, from 1991 to 2001, the countries in the low P/B portfolio (Q1) had a real GDP growth of 3.1%. The countries in the high P/B portfolio (Q4) had an average real GDP growth of 5.4%. The difference in average real GDP growth between the Q1 and Q4 portfolios is  $-2.3\%$  with a t-value of  $-9.7$ . We conclude that the countries in the low price-to-book portfolio on average had significantly lower real economic growth at time of portfolio formation than countries in the high price-to-book portfolio.

Similarly, Table 9 also shows that the countries in the low P/B portfolio had significantly higher real GDP growth volatility compared to the countries in the high P/B portfolio. Additionally, the low P/B countries suffered from significantly higher inflation rates than countries in the high P/B portfolio at the time of formation. The currencies of the low P/B countries more overvalued on average and the variability of the currencies was also higher than for the countries in the high P/B quartile.

**Table 9: Average of the five macroeconomic variables for the price-to-book quartile portfolios.** The table shows the average macroeconomic exposure for the Q1 and Q4 quartile P/B portfolios, and for the long/short portfolio. The fifth column contains the t-statistics for the average difference in exposure between the Q1 and Q4 quartile portfolios (long/short strategy). We use real growth (RG), volatility of growth (RGV), inflation (IF), currency valuation (PPAFX) and currency volatility (FXV) as local macroeconomic variables. The portfolio measures of these variables are constructed each month by equally weighting the observations for each of the countries in the quartile portfolio. The table displays the overall average of the monthly time series of portfolio exposures from January 1991 to December 2001.

Variable	Q1 (long)	Q4 (short)	Q1 – Q4 (long/short)	T-value
RG	3.1%	5.4%	-2.3%	-9.7
RGV	5.3%	1.6%	3.7%	14.2
IF	142.8%	17.3%	125.47%	6.8
PPAFX	9.1%	3.1%	6.0%	9.8
FXV	0.31	0.13	0.18	10.1

The differences in macroeconomic variables between the low P/B and the high P/B portfolios are striking and significant. Over the entire sample period, the low P/B portfolio (Q1) is comprised of countries with significantly lower real economic growth rates, more volatile economic growth, higher inflation and more overvalued and volatile currencies. Apparently the price-to-book strategy is buying recent “macroeconomic losers” and selling recent “macroeconomic winners”. For example, in the early 90’s, the long portfolio was frequently investing in Argentina and Brazil, which had just experienced very high inflation, low economic growth and currency turmoil at that time. The short portfolio in the early 90’s contained Thailand and India amongst others, countries that just went through a period of high economic growth and relatively low inflation. After portfolio formation the equity markets of macroeconomic “losers” often outperformed the winners though, as the average return of the low P/B portfolio is significantly higher than the return of the high P/B portfolio.

Our results seem to offer an interesting analogy with earlier research on the value premium, such as Lakonishok, Shleifer and Vishny [1994]. The countries in the low P/B portfolio might be perceived by investors as “losers” with a bad economic outlook based

on current conditions (lower and more volatile growth, higher inflation, currency turmoil etc.): subsequently these countries trade at a discount and have lower price-to-book ratios. Investors seem to expect no improvement of economic conditions. Still, these countries tend to show better equity market performance afterwards than the high price-to-book countries. Lakonishok, Shleifer and Vishny [1994] provide a behavioural explanation for the superior returns of value strategies: naïve investors extrapolate past experience too far in the future. The next section examines whether this explanation is also plausible for the value premium at the country level in emerging markets.

#### **4.3 Extrapolation of past economic trends**

In order to test whether the extrapolation hypothesis of Lakonishok, Shleifer and Vishny [1994] is a credible explanation for the excess return of the value strategy we examine how the macroeconomic properties of the countries in the price-to-book portfolios develop after initial portfolio formation.

Our procedure is as follows:

- 1) At the start of each month we sort the countries in the quartile portfolios based on the price-to-book ratio (as in Section 3.1),
- 2) For each quartile portfolio, we record the macroeconomic characteristics of the countries and weight them equally to get a measure at the portfolio level (as in Section 4.2).
- 3) Next we keep the initial portfolio composition fixed, while we record how the macroeconomic characteristics of the quartile portfolios evolve over time, from one month up to 36 months after portfolio formation.
- 4) We repeat step 1 through 3 for all months in the sample to get 36 time series of macroeconomic characteristics at the portfolio level, one for each month after portfolio formation (up to 36 months after portfolio formation).

- 5) We calculate the average of these 36 time series, for each macroeconomic measure at the portfolio level.

The approach described indicates how the macroeconomic fundamentals develop after initial portfolio formation. As an example, Figure 3 shows the post formation development of average real GDP growth at the portfolio level. Initially, at the time of portfolio formation, the low price-to-book portfolio (Q1) is comprised of countries growing at lower real rates than the countries in the high price-to-book portfolio (Q4). However, post formation the growth rates start to converge. The high price-to-book countries (Q4) witness slower growth post formation, whereas growth accelerates for the low P/B countries that were past laggards in economic growth (Q1).

A potential explanation for the value premium and the observed reversal of real economic growth rates might be that investors extrapolate past economic conditions of emerging markets too far into the future. The investors might expect high GDP growth to continue indefinitely for the winning countries in the high P/B portfolio and hence they bid up equity prices. Similarly, the investors might not expect a reversal of growth for the countries in the low P/B portfolio, leading to depressed equity prices.



**Table 10: Average of the five macroeconomic variables for the long-short price-to-book portfolio, at portfolio formation vs. 36 months after formation** The table shows the average macroeconomic exposure for the long/short price-to-book portfolio (Q1 - Q4), both at portfolio formation date (2<sup>nd</sup> column) and 36 months afterwards (3<sup>rd</sup> column), while keeping portfolio weights fixed. The fourth column contains the change in the average of the macroeconomic variable from portfolio formation to 36 months afterwards (t-statistics below). We use real GDP growth (RG), volatility of real GDP growth (RGV), inflation (IF), currency valuation (PPPFX) and currency volatility (FXV) as local macroeconomic variables. The table displays the overall average of the time series of monthly macro-economic exposures at the portfolio level from January 1991 to December 2001.

Variable	Q1 – Q4 at portfolio formation	Q1 – Q4 36 months after formation	Change in exposure from formation to 36m after
RG ( <i>t-value</i> )	-2.3% (-9.6)	-0.7% (-2.8)	1.5% (3.4)
RGV ( <i>t-value</i> )	3.7% (14.2)	1.3% (7.8)	-3.2% (-12.1)
IF ( <i>t-value</i> )	125.4% (6.8)	97.8% (3.4)	-74.6% (-2.0)
PPPFX ( <i>t-value</i> )	6.0% (9.8)	8.9% (7.8)	2.8% (1.7)
FXV ( <i>t-value</i> )	0.18 (10.1)	0.09 (4.8)	-0.15 (-9.9)

**Figure 3: Post formation development of real GDP growth for the Q1 and Q4 price-to-book portfolios.** The figure displays the development of average real GDP growth of the countries in the Q1 and Q4 quartile P/B portfolios, from the time of portfolio formation until 36 months after portfolio formation. It also displays the development of real GDP growth post formation for the long short portfolio (Q1 – Q4).

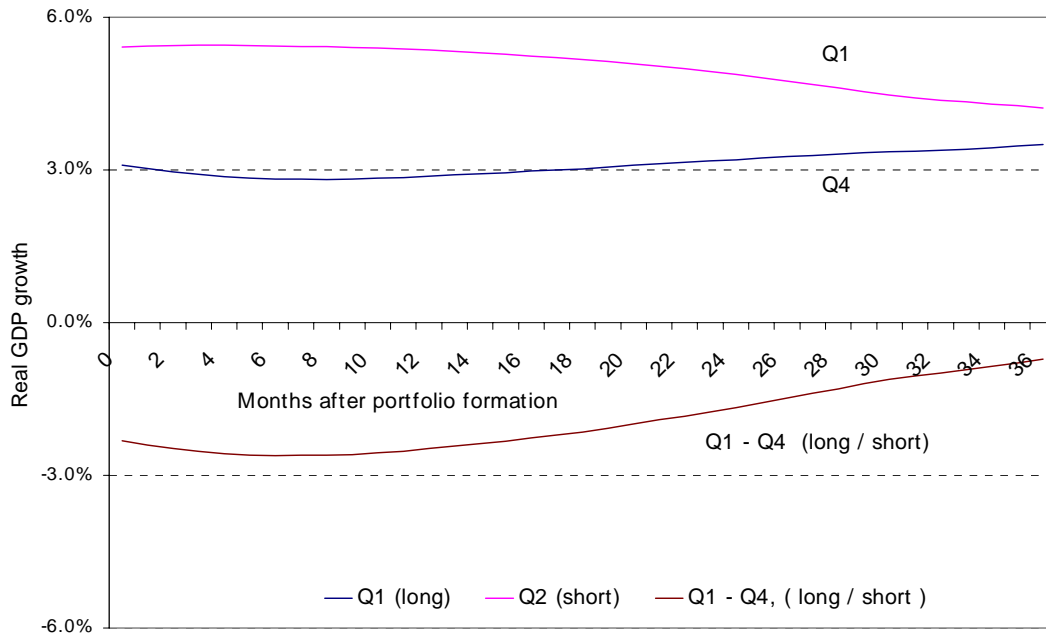


Table 10 provide additional statistical evidence for the extrapolation hypothesis. The 3<sup>rd</sup> column of Table 10 shows that 36 months after portfolio formation, the countries in the low P/B portfolio still have significantly worse macroeconomics fundamentals than the countries with high P/B: lower economic growth, higher volatility of growth rates, higher inflation, a more overvalued currency and a more volatile currency. However, although the low P/B countries (Q1) are still in a relatively bad economic shape after 36

months, the gap with the high P/B countries (Q4) has reduced significantly (4<sup>th</sup> column of Table 10). The only economic variable that does not show a significant improvement 36 months after portfolio formation is currency overvaluation (PPPFX).

Summarising, these results seem to support the idea that differences in macroeconomic risk factors are a partial explanation for the value premium at the country level, in combination with extrapolation of past economic trends. Countries that are trading at lower price-to-book values might be considered more risky by investors based on poor past and current economic fundamentals. However, after portfolio formation these countries defy the (low) expectations and show some economic improvement, leading to good stock market performance. On the contrary, countries with high price-to-book values are expected to perform well in the future based on past and current favourable conditions, and as a result they have more difficulties to beat expectations, leading to relatively subdued equity market performance.

## **7. SUMMARY AND CONCLUSION**

Our results confirm the profitability of value investing at the country level in emerging markets. A portfolio of countries with low price-to-book ratios significantly outperforms a portfolio of high price-to-book countries. Global risk factors cannot explain the outperformance of a long-short value strategy, even after taking substantial transaction costs into account. Next we measure a number of macroeconomic variables of the countries in the long and short value portfolios, as a proxy for local risk factors. We find that the countries in the low price-to-book portfolio on average have significantly lower economic growth, higher growth volatility, higher inflation, more overvalued currencies and more volatile currencies, compared to the high price-to-book portfolio. Analogous to stock selection studies, countries with poor current macroeconomic fundamentals consistently show up in the value portfolio. After portfolio formation, the difference in economic fundamentals between the high and low price-to-book portfolios decreases

significantly, which indicates that investors might be extrapolating past economic trends too far into the future.

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